

COLLEGE OF NATURAL AND COMPUTATIONAL SCIENCE

DEPARTMENT OF BIOLOGY

PREVALENCE OF TRACHOMA AMONG PATIANTS TREATED AT ATAT HOSPITAL, GURAGE ZONE, SOUTH WEST ETHIOPIA.

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Lists of Acronyms/Abbreviations

CT- *Chlamydia trachomatous*

SNNPR-Southern Nation Nationality Peoples Region

TT – *Trachomatous trichiasis*

WHO-World Health Organization

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ABSTRACT

Trachoma (in Greek" rough") is communicable conjunctivitis usually of chronic evolution caused by a microorganism called Chlamydia trachomatis, primarily affecting a superficial epithelial, characterized by the formation of follicles and papillary hyperplasia.

This study is aimed to know the prevalence of Trachoma among patients at Attat hospital from 2008-2010 by using medical records of patients as a secondary data.

A retrospective study was carry out to assess the prevalence of the infection. Data was analyzed by using scientific calculator and the prevalence of this disease was identified as well as the result of this data was formulated in the form of tables and figures. The result of analyzed data showed that the prevalence of Trachoma was decreased from 2008-2010 might be due to awareness of people, improvement of a personal hygiene, environmental sanitation, and public education to further minimize the prevalence of this disease, the concerned body should aware the community again and again about the causes of this disease and in power the society to keep the personal, water, latrine and environmental sanitation. Additional studies concerning this disease should be occurring frequently.

Key words*:* Trachoma, Prevalence, Blindness, Communicable disease, Trachoma epidemic, Transmission.

1. Introduction

1.1. Background of the study

Trachoma (in Greek "rough") is communicable kerato-conjunctivitis usually of chronic evolution caused by a vector called *Chlamydia trachomatis*. It affects primarily the superficial epithelium which is characterized by the formation of follicles, papillary hyperplasia and pannus formation and it causes the visual disability (West *et al*., 2001).

The history of trachoma goes back to the earliest medical records and embraces some five millennia. It was known in China where trichiasis was treated in the 27th century B.C. It was also endemic among Sumerians of Mesopotamia (before 2000 B.C) and it was a scourge in ancient Egypt where the evidence of papyri and of forceps used for trichiasis places experience of its ravages at any rate back to the 19th century B.C. It was also common in ancient Greece and in the 5th Century B.C (Alemayehu ,1981). Today, in developing countries for the greatest part tropical, trachoma is one of eye diseases, which is most responsible for suffering and for the greatest incidences of blindness. According to WHO report (in 1979), trachoma caused blindness 40.6% of rural population of Uganda and in 35% of Kenyan rural population (Srinivasan *et al*., 2001).

In Ethiopia the national survey done on the prevalence of trachoma in 2005-2006 showed that, both active trachoma and trachomatous trichiasis, is concentrated in some regions of the country (Amhara, Oromia, SNNPR) that account for the large proportion of the country's population. These regions have large rural population, and poor environmental and hygienic conditions favor trachoma transmission. Overall, the prevalence of active trachoma among children were 9 million and over 1.2 million trachomatous trichiasis among 15 years and above (Paolo *et al*.,2009). Rural/urban differences in active trachoma and gender differences in trachomatous trichiasis are marked indicating the general inequality in the availability of clean water and sanitation. Facilities in the population; and the gender inequality in accessing prevention and treatment services (Polack *et al*., 2005). Due to different factors trachoma is also spread over different places in southern nations nationalities and peoples region, those factors include familial cattle ownership, having a tin roof on the house facial cleanliness, and living more than

hours away from a water sources in dry season both time points were evaluated for their effect on persistent trachoma. Those all factors are found in all zones of SNNPR including the Guragehe zone.

1.2 Statement problem

Trachoma is one of the countries labeled as "trachoma epidemic" by WHO (Polack *et al*., 2005), an estimated 68,961,045 people live in trachoma endemic areas-the largest number in Africa (Polack *et al*., 2005). Further Considering the population of Ethiopia in 2006; it was estimated that over 9 million children are affected by active trachoma and over 1.2 million people 15 years and above are suffering from *Trachomatous trichiasis* (TT). More over studies showed that many people suffering from trichiasis do not seek medical care due to lack of transportation and cost of treatment (Paolo *et al*., 2009).

Although effective prevention strategies and treatment are available, trachoma still remains the major cause of infectious blindness worldwide (West and Sommer, 2001). However available reports indicate that the prevalence of trachoma is quite high in Ethiopia throughout the country. A study by (Lemma, 2001) estimated the prevalence rate of trachoma to be 40.9% in children age 5 to15 years in Wollo, north eastern-Ethiopia. Another study in Gonder region, Northern Ethiopia, the prevalence in children 5-9 years was found to be 43% (Zerihun ,1998), while a community based survey in Gurage zone, southern Ethiopia showed the prevalence of active trachoma to be 25% in all age groups and 35.7% in children age less than 10 years (Zerihun,1996). Gurage administrative zone where one of the trachoma hyper epidemic parts of the country in which it has its own certain estimation that indicates the prevalence of trachoma in males and females.

Even though many studies are carried out in different parts of Ethiopia including southern region, getting such an accurate data in different health centers is somehow impossible as there is no enough information documented about trachoma, and similarly this problem is also common in Guraghe zone. So we need to conduct more study on magnitude of trachoma and its prevalence based on the data obtained from the patients treated in Attat hospital from 2008-2010E.C. Particularly in this study area, there was no previous study done on the prevalence of

trachoma. So this study was aimed to know prevalence of trachoma among patients those are treated in Attat hospital.

1.3. Objectives of the study

1.3.1 General objectives

To assess the prevalence among patients those are treated in Attat Hospital from 2008-2010E.C.

1.3.2 Specific objectives

- To identify the prevalence of trachoma among patients treated in Attat Hospital.
- To explain adequate information about the trends, transmission and treatment methods of trachoma among the patients.

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1.4. Significances

It is clear that trachoma is a leading cause of eye problem in children as well as adult populations. Approximately 80% of blindness in Ethiopia is believed to be avoidable; i.e., either preventable or curable and trachoma is one of the major causes of low vision and blindness (Alemayehu, 1995).

Therefore:-

- It has a significant input to know the prevalence of trachoma in the study area.
- It provides adequate information about the prevalence, trends, transmission, infection and treatment of trachoma.

2. Literature Review

Trachoma is the oldest infectious disease of the eye in the world. It is a major public health threat and main cause of visual impairment of children and elders in the poor sanitation communities, particularly in Asia and Africa. Epidemic trachoma constituted a major public health threat and is the chief cause of visual impairment and preventable cause of blindness in certain developing countries either can be cured or could be prevented through giving emphasizes on increasing to eye care. Trachoma is a chronic and recurrent conjunctivitis caused by a bacterium called *Chlamydia trachomatis*. It is transmitted through direct contact with infectious ocular or nasopharyngeal discharge from infected people on fingers. It can also be transmitted indirectly with contaminated fomite such as towels, clothes and other soiled materials. Flies contribute to the spread of the disease (Journal of community eye health, 2002).

Trachoma begins as an inflammation of conjunctiva with the formation of small tumor like masses (lymph follicles). Infected cells die and the surrounding areas become filled with discharge. Scar tissue containing fibroblasts develop and can extend into the eyelids. As the disease progresses the eyelids are turned inwards. The eyelashes rub on the conjunctiva causing corneal ulceration. As a result of repeated rubbing of the cornea, loss of vision may occur. Vision 2020, the global programmer to eliminate avoidable blindness, list trachoma as one of five target diseases, alongside cataract, child hood blindness, onchocerciasis and refractive errors (Ophthalmology review,2002).

2.1 Prevalence

Although trachoma has largely disappeared from most of the Western world, it continues to be a major cause of blindness in the developing countries. Trachoma is still prevalent in large regions of Africa, the Middle East, Southwestern Asia, the Indian Subcontinent, and Aboriginal communities in Australia. In addition, there are small foci of blinding disease in Central and South America (Dawson *et al*., 1981). Within these countries, trachoma is more common in the particularly underdeveloped areas, where good water supplies and basic sanitation services are lacking. Even within hyper endemic areas, trachoma clusters both at the neighborhood and at the household level (West *et al.,* 1991).

In southern Ethiopia, in Gurage, the population will show to have clinically active trachoma. Both active and cicatrical trachoma were significantly associated with living in rural areas, having illiterate parents, and not having a latrine. A current population based rapid trachoma assessment carried out in Attat hospital an area established by government for people purpose of Gurage zone, southern Ethiopia evidenced the overall prevalence of active trachoma will be estimated among the patients and the estimated prevalence of *Trachomatous trichiasis* among people above 15 years of age will be estimated. These study revealed that trachoma has been endemic in these district and strongly associated with individual's hygiene like facial cleanliness and environmental risk factors such as presence of functional latrine, solid waste disposal within distance of 20m from the house and water source at more than 30minutes of walking distance (Ejigu *et al*., 2013).

2.2. Mode of transmission

Trachoma is an infectious disease, and transmission can occur by sharing clothes, towels, or sleeping quarters. Therefore, trachoma is passed among family members and, in some settings, between families in households that are in close proximity (Graystan *et al*., 1972). The variation in trachoma prevalence between neighborhoods in the same village can be several-fold (West *et a1*., 1991). Crowded living conditions in the family unit appear to increase the risk of trachoma. With increasing numbers of persons per sleeping area, the prevalence of active trachoma has been shown to increase (Bailey *et al.,* 1989). The association is logical, as there is more exposure to infection or disease via close contact (Luna *et al*., 1992). A large family per se is not necessarily a risk factor for active trachoma in children (Barenfanger, 1975). Rather, the risk appears to be related to the likelihood of contact with an infected individual, and larger families are more likely to have preschool children who have the highest prevalence of infection. Thus, several studies have found that mothers of children with trachoma are more likely themselves to have active disease, compared with women who either did not take care of children or whose children did not have trachoma (Taylor *et al.,* 1985).

2.3. Causative agents

2.3.1 Water availability and use

Poor hygienic conditions due to lack of available water have long been associated with the risk of trachoma. Several studies have found a positive association between the distance from the household to the water source and the prevalence of active trachoma (Tielsch *et al.,* 1988). Clearly the distance to water can place constraints on the amount of water brought to the house, and water becomes a scarce resource whose use for hygiene purposes may be limited.

However, other research suggests that the availability of water may be less of a factor than household decisions on how water is to be utilized. In a large prevalence study, (West *et al*., 1989) found that although distance to water was related to trachoma, there was no relationship to the observed amount of water available for use in the household, nor was there a relationship between a functional water supply in the village and the prevalence of trachoma. In addition (Bailey *et al*., 1991). found in a village in the Gambia that after controlling for family size, distance to water, and other socioeconomic factors, families with trachoma used less water for washing children than did the control families without trachoma, regardless of the amount of water available for consumption. In general, in areas where trachoma is endemic, communities with a poor water supply are more likely to have higher trachoma prevalence (Ballard *et a*l., 1983), but the provision of adequate water does not necessarily ensure that trachoma rates will decline. The decision to use water to improve hygienic conditions is very complex in these communities and is clearly an important factor as well (Causley *et al*., 1990).

2.3.2 Flies

One of the earliest risk factors noted for trachoma was the presence of flies (Wilson, 1932). Eye-seeking flies can carry *Chlamydia trachomatis* on their legs and in the contents of their proboscis. Their ability to act as physical vectors for the transmission of infection has been demonstrated in laboratory settings (Forsey, 1981). In Tunisia and India, epidemics of bacterial conjunctivitis and increases in the prevalence of active trachoma have been observed after peaks in the fly population (Dawson *et al*., 1975). Furthermore, studies in Tanzania have found an association between fly density in the household or the presence of flies on children's faces and the presence and severity of trachoma as well as infection with C. trachomatis (West *et al*.,

1991). However, flies are probably not the most important source of transmission, as others have found trachoma where the fly populations are absent or less intense (Reinhards *et al.*, 1968).

2.3.3 Cattle

Although cattle are not a reservoir or a physical vector for Chlamydia infection, the presence of cattle and cattle ownership has been associated with trachoma in some African countries (Taylor *et al*., 1989). In arid environments, cattle droppings create an optimal environment for breeding flies, and this has been the explanation for the association of cattle with trachoma.

However, flies and cattle were independent predictors of severe trachoma in Tanzania, which suggests that cattle ownership is a marker for other important factors (Taylor *et al*., 1989). In some societies, cattle not only are a sign of traditional wealth but also mark families with traditional lifestyles who tend to have the poorest living conditions.

2.3.4 Hygiene

In general, poor hygienic conditions favor the transmission of C. trachomatis through contact with ocular and other secretions that carry the infection (Jones, 1980). Several studies have been carried out to identify the specific hygiene practices associated with a lower risk of active trachoma. These studies have evaluated the use of latrines, handkerchiefs, and towels as well as face washing in children. The presence of a functional latrine near the house has been associated with lower trachoma prevalence in several different countries. The mechanism by which the presence of a latrine would decrease trachoma is not entirely clear. In Egypt, found that the presence of a latrine was related to other measures of higher socioeconomic status, such as higher occupational level and more education of the head of the household, larger farm animals, and larger farming plots (Lane, 1991).

2.4 Clinical signs of trachoma

Active trachoma is a chronic, follicular conjunctivitis, characterized by an inflammatory response to a series of infections throughout childhood. Children with active trachoma present with follicles and papillae, the latter a marker for the intensity of the inflammation. Follicles are yellow or white "spots" in the tarsal conjunctiva and consist of lymphoid tissue containing B

lymphocytes. Severe, inflammatory trachoma presents as thickening of the conjunctiva with inflammation obscuring the deep tarsal vessels. The presence of pus with severe inflammation usually indicates a bacterial infection. Limbal follicles may appear, and new vessels develop, producing corneal pannus. Once the limbal follicles resolve, depressions remain on the cornea, resulting in the pathognomonic sign of trachoma, "Herbert's pits."(Taylor *et al*., 1982).

3. Methods and Materials

3.1. Study Area and Study Period

The study was conducted in Attat Hospital, Cheha woreda, Gurage zone, SNNP region, and southern west of Ethiopia. Its located 175km south west of Addis Ababa, 17km off the town of Wolkite on the road to Hosanna in Cheha Woreda of Guraghe Zone, SNNPRs and managed and run by Medical Mission Sisters under the Eparchy of Emdibir since its establishment back in 1969 G.C. It renders service to more than 300,000 peoples with in and out of the operational area with an average daily load of 272 with only five working days in a week.

This study was focused on the prevalence and associated risk factor of trachoma patients who were taking treatment service in Atat hospital from 2008-2010E.C.
(http://www.placemap.net/ET/Attat.hospital-3842)

3.2 Study Design

A retrospective study was conducted using secondary data of the patients with trachoma treated in Attat Hospital from 2008-2010E.C.

3.3 Study population

The study populations were patients those suffered from trachoma and attended Attat hospital from 2008 - 2010 E.C.to get treatment or service.

3.4 Data collection instrument

A recorded secondary data was used from Attat hospital. The collected data recorded from the year 2008 to 2010.

3.4 Data analysis

The collected data was analyzed by using scientific calculator and the result will be presented in the form of table, graph or chart.

4. Results and Discussion

In the retrospective study designated to determine the prevalence of trachoma among patients infected in Attat Hospital from 2008-2010 E.C the following results were obtained. The prevalence of trachoma infection among the peoples who diagnosed and treated in Attat hospital is listed here below in different tables.

In the year of 2008 E.C, from the peoples who visited Attat hospital for trachoma treatment 307 were positive to the infection. In august many peoples were come to Attat hospital from different areas for the treatment of trachoma due to this it is the most prevalent month for trachoma and September was the least prevalent month (table 1). From the total infected persons females were higher than males. Based on age distribution of diagnosed individual from 16-45 of age peoples were the most infected peoples (table).

Table 1: Number of individual patients infected by trachoma in 2008 E.C

NO	**Months**	**Sex**	**Age of patients infected in year 2008 E,C**				
		M/F	1-15	16-45	>45	Total	Ground total
1	September	M	0	0	0	0	4
		F	0	3	1	4	
2	October	M	0	7	1	8	21
		F	1	11	1	13	
3	November	M	0	2	1	3	10
		F	0	7	0	7	
4	December	M	1	6	1	8	20
		F	0	12	0	12	
5	January	M	0	10	0	10	20
		F	0	10	0	10	
6	February	M	1	16	3	20	48
		F	3	21	4	28	
7	March	M	0	15	4	19	40
		F	0	15	6	21	

8	April	M	0	6	0	6	26
		F	0	10	10	20	
9	May	M	0	4	0	4	9
		F	0	5	0	5	
10	June	M	0	4	0	4	14
		F	0	10	0	10	
11	July	M	0	4	0	4	16
		F	0	12	0	12	
12	August	M	6	12	20	38	79
		F	7	18	16	41	
Total			19	220	68	307	307

Of the peoples who visited Attat hospital for trachoma treatment in 2009 E.C a total 281 peoples were positive to trachoma. Similar to the year of 2008 E.C females were the most infected peoples. From months of this year March was the month with high prevalence of the diseases and September was the least prevalent (table 2).

Table; - 2 Number of individual patients infected by trachoma in 2009 E.C

NO	**Months**	**Sex**	**Age of patients in Year**				
		M/F	1-15	16-45	>45	Total	Grand total
1	September	M	0	0	0	0	6
		F	0	6	0	6	
2	October	M	0	5	0	5	11
		F	0	6	0	6	
3	November	M	0	4	0	4	19
		F	0	15	0	15	
4	December	M	0	5	0	5	11
		F	0	6	0	6	
5	January	M	0	10	0	10	30
		F	0	20	0	20	
6	February	M	1	2	1	4	17
		F	0	10	3	13	
7	March	M	1	20	4	25	68
		F	0	30	13	43	
8	April	M	1	11	1	13	55
		F	1	40	1	42	
9	May	M	1	8	1	10	27
		F	1	15	1	17	
10	June	M	0	1	0	1	5
		F	1	2	1	4	
11	July	M	0	2	0	2	12
		F	1	9	0	10	
12	August	M	0	1	1	2	20

		F	1	16	1	18	
Total			9	244	28	281	281

In 2010 E.C from the peoples who visited the hospital for treatment 255 of them were positive to the infection. In December only 9 of the visitors were diagnosed positive which was the least in the year and in March 43 peoples were diagnosed with trachoma infection and 40 of them were females (table).

Table; - 3 Number of individual patients infected by trachoma In 2010 E.C

NO	**Months**	**Sex**	**Age of patients in Year**				
		M/F	1-15	16-45	> 45	Total	Ground total
1	September	M	0	3	1	4	18
		F	0	13	1	14	
2	October	M	0	11	1	12	28
		F	1	12	3	16	
3	November	M	0	4	2	6	15
		F	0	7	2	9	
4	December	M	0	4	0	4	9
		F	0	4	1	5	
5	January	M	0	1	1	2	5
		F	1	1	1	3	
6	February	M	1	12	1	14	33
		F	1	17	1	19	

7	March	M	0	2	1	3	43
		F	1	37	2	40	
8	April	M	0	4	1	5	36
		F	1	19	11	31	
9	May	M	1	6	0	7	25
		F	1	17	0	18	
10	June	M	0	3	0	3	10
		F	0	7	0	7	
11	July	M	0	4	0	4	14
		F	0	10	0	10	
12	August	M	1	2	1	4	19
		F	2	10	3	15	
Total			11	210	34	255	255

Over all when we compare prevalence of the disease between the three consecutive years, 2008 E.C were the most prevalent year (table 4) and also when we see the prevalence of the disease based on gender, females were the most infected group in all these three years. According to Polack *et al.,* (2005) the factors which aggravates the infection and spread of trachoma are like familial cattle ownership, having a tin roof on the house, lack facial cleanliness due to the lack of water, smock etc. It is obvious that females are the most exposed group to this disease to the responsibility they have to carry for their families. Females responsible for cooking, females are responsible for the milking and these things made them to be more vulnerable for the infection. The other may be also, females most of the time have exposed the cattle's dung from home to an outside and this leads to their eyes may be infected by flies those found in such dung.

Table; - 4 The Prevalence of trachoma among male and female in each year.

Years	**Sex** M/F	Frequency		Prevalence (%)
2008	M	124	307	40.39%
	F	183		59.61%
2009	M	81	281	28.8%
	F	200		71.2%
2010	M	68	255	26.7%
	F	187		73.3%

Of the three age groups, the disease prevalence was high on the age group from 16-45 years age. This may be due to the exposure of this group to different activities. But this is not in agreement with different researches. Most literatures indicates that, the most exposed age groups are children. According to Zerihun (1996), community based survey in Gurage zone, trachoma was reported 35.7% in children age less than 10 years. Another study in Gonder region, Northern Ethiopia, the prevalence in children 5-9 years was found to be 43% (Zerihun, 1998).

According to Birhan(2007), report from Wollo individuals who were mostly infected by trachoma were children an age group of 11-14 years, may be children are not aware the impact of playing on areas where is unhygienic.

Also the sum of the number of patients treated in three years (2008, 2009, 2010) is 39, 674,130 in an age 1-15, 16-45,>45 respectively. They are represented below diagram;-

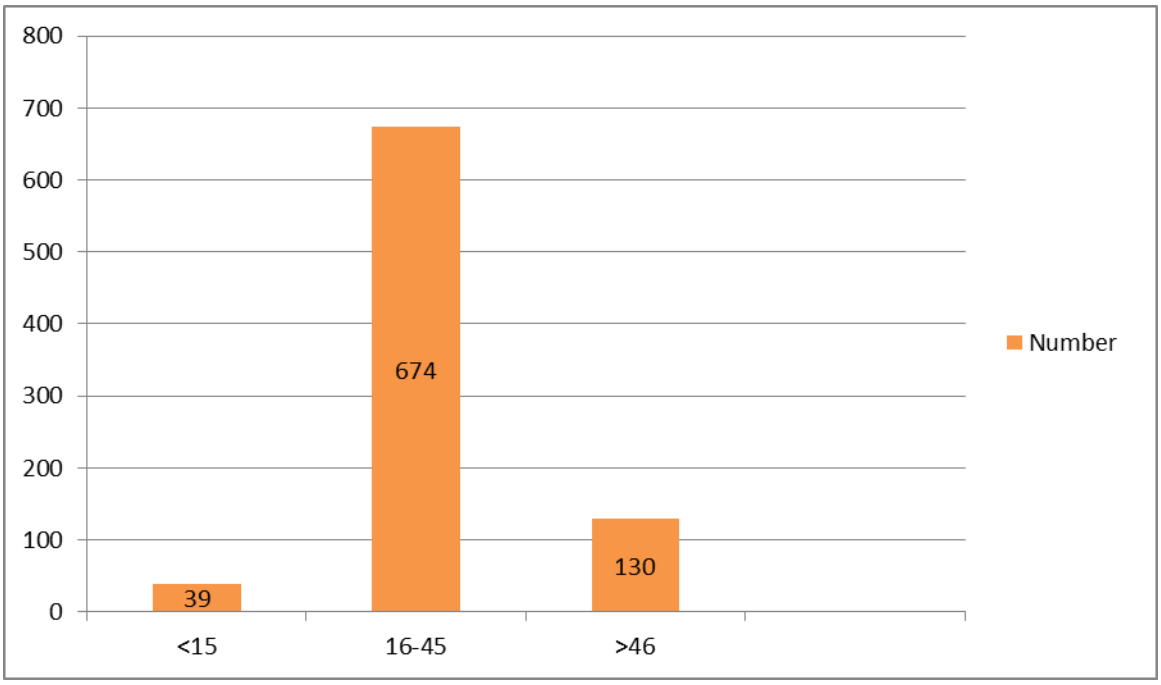


Fig 4.1 category of patients by age

According to the data we obtained, in the course of these three years the number of peoples infected by trachoma were decreased from year to year. This was may be due to the involvement of all concerned bodies on health education and may be due to peoples giving care to their personal and environmental hygiene. Based on above figure (1) an individuals who found between an age group 16-46 were mostly affected by trachoma. Because those were exposed to th many environmental activities and mostly they have involved by cleaning of an environments which was contaminated by cattle's dung, flies, poor sanitation and poor water availability. Then cattle dungs provide an optimum condition for survive of many flies. These flies are most causative agents for trachoma.

5. Conclusion and Recommendation

5.1. Conclusion

The study was conducted at Attat hospital to know prevalence and the effects of trachoma on health conditions among patients treated from 2008-2010.During this year the prevalence of trachoma at Attat hospital were not found in the same way i.e.it was decreased from time to time. According to data obtained from hospital an adult individuals especially an individuals of age between 15-45 and females are likely to be infected by this disease. Trachoma is the oldest infectious disease of the eye in the world. It is the major cause of ocular morbidity and blindness in individuals of impoverished communities' particularly in Asia and Africa. The major causative agents of this disease are flies, poor personal hygiene and poor environmental sanitation thus, encouraging the awareness of the people on the effect of this disease can reduce the chance of individuals to be infected by this disease.

5.2. Recommendation

- ✓ Promotion of health education in prevention of trachoma and causative agents of this disease at community level should be given by woreda health officers, regional health bureau and concerned body
- ✓ Strengthening inter-sectorial collaboration between health system and health related sectors, like education, water supply and community stake holders, regional health bureau and all concerning bodies.
- ✓ Each and every individual must kept the environment from any contamination which causes the disease of Trachoma.
- ✓ Experience sharing is essential for avoid and limit the disease distribution.
- ✓ Further study would be conducted.

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